AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

1. (Previously Presented) A multiple source array comprising:

a guided-wave structure in which one or more guided-wave modes are excited during operation, said guided-wave structure including a dielectric core and a cladding covering the dielectric core; and

an array of dielectric-filled, guided-wave cavities in the cladding extending transversely from the dielectric core and forming an array of apertures through which optical energy that is introduced into the core exits from the core, each cavity of the array of cavities having one or more transmission modes that during operation couple to the one or more guided-wave modes of the guided-wave structure thereby causing said optical energy to exit from the core through each aperture of the array of apertures.

2. (Original) The multiple source array of claim 1 wherein the dielectric core is a planar dielectric core, wherein the cladding includes a first dielectric cladding layer covering a first side of the dielectric core, and a second dielectric cladding layer covering a second side of the dielectric core that is opposite from the first side, and wherein the array of dielectric-filled, guided-wave cavities extends transversely from the dielectric core into the first dielectric cladding.

3. (Original) The multiple source array of claim 2 wherein the guided wave structure in response to receiving a source beam characterized by a wavelength λ_0 generates excited-wave modes and wherein the first and second cladding layers each have a thickness such that leakage through the first and second cladding layers represent a negligible loss to the guided-wave modes.

4. (Previously Presented) The multiple source array of claim 2 wherein the guided wave structure in response to receiving a source beam characterized by a wavelength λ_0 generates excited-wave modes characterized by an extinction coefficient for each of the first and second dielectric cladding layers and wherein the first and second dielectric cladding layers each have a

thickness such that the thickness of the respective cladding layer times the extinction coefficient is on the order of 10 or more.

5. (Original) The multiple source array of claim 2 wherein the index of refraction of the core is greater than the index of refraction of the first and second cladding layers.

6. (Original) The multiple source array of claim 5 wherein the index of refraction of the dielectric that fills the cavities is greater than the index of refraction of the first cladding layer.

7. (Original) The multiple source array of claim 6 wherein the dielectric of the core is the same as the dielectric filling the cavities.

8. (Previously Presented) The multiple source array of claim 1 wherein the cavities have a rectangular cross-section in a plane that is parallel to the planar dielectric core.

9. (Previously Presented) The multiple source array of claim 2 wherein the guided wave structure is designed to operate at a wavelength λ_0 and wherein the cavities have a width that is on the order of $\lambda_0 /2n_f$ wherein n_f is the index of refraction of the dielectric in the cavity.

10. (Original) The multiple source array of claim 1 wherein the cavities have a width selected so that there exist transmission modes of the guided wave cavities that couple to excited wave modes of the guided wave structure.

11. (Original) The multiple source array of claim 2 wherein the array of dielectric-filled cavities is a two dimensional array.

12. (Previously Presented) The multiple source array of claim 1 wherein the guided-wave structure is designed to operate at a selected wavelength λ_0 and wherein the cavities have apertures that are sub-wavelength in size.

13. (Original) The multiple source array of claim 2 further comprising a source that during operation generates and delivers an optical beam to the dielectric core.

14. (Original) The multiple source array of claim 13 wherein the guided-wave structure during operation confines the delivered optical beam by total internal reflection and produces excited guided-wave modes.

15. (Original) The multiple source array of claim 2 further comprising a prism coupler located against the first side of the dielectric core for coupling an optical input beam into the dielectric core.

16. (Original) The multiple source array of claim 15 wherein the prism coupler includes a prism having an output facet and includes a dielectric layer that is sandwiched between the output facet and the dielectric core, wherein the dielectric layer has an index of refraction that is different from the index of refraction of the dielectric prism.

17. (Original) The multiple source array of claim 16 wherein the prism has an index of refraction (n_p) and the dielectric layer has an index of refraction (n_s) and wherein $n_s < n_p$.

18. (Original) The multiple source array of claim 15 wherein the dielectric layer is of uniform thickness and the output facet of the prism is parallel to the first side of the dielectric core.

19. (Original) The multiple source array of claim 15 wherein the dielectric layer is tapered and the output facet of the prism is in a non-parallel relationship with the first side of the dielectric core.

20. (Original) The multiple source array of claim 15 further comprising a first mirror element defining a mirrored first surface through which the optical input beam passes on its way to the prism and a second mirror element defining a second mirror surface which with the first

mirror surface forms a Transversely Coupled Fabry-Perot Resonator (TCFPR) having a cavity that includes the prism.

21. (Original) The multiple source array of claim 20 further comprising an element for modulating resonant properties of the TCFPR.

22. (Original) The multiple source array of claim 21 wherein the element for modulating resonant properties of the TCFPR is selected from the group consisting of an electro-mechanical transducer, an electro-optical phase modulator, and a device that operates by using thermal expansion.

23. (Original) The multiple source array of claim 1 wherein the dielectric core is made of a material that transmits in the UV.

24. (Original) The multiple source array of claim 2 further comprising a compensating layer of low index of refraction dielectric positioned so that light emanating from the array of cavities passes through the compensating layer.

25. (Original) The multiple source array of claim 24 wherein the cavities of the array of cavities terminate at the compensating layer.

26. (Original) The multiple source array of claim 2 wherein the dielectric core is made of a material selected from the group consisting of lithium fluoride, calcium fluoride, fused silica, magnesium aluminum spinel, aluminum oxynitride spinel, YAG, tantalum pentaoxide, and cubic carbon.

27. (Previously Presented) A multiple source array comprising:

a guided-wave structure in which one or more guided-wave modes are excited during operation, said guided-wave structure including a planar dielectric core, a first dielectric cladding layer covering a first side of the dielectric core, and a second dielectric cladding layer covering a second side of the dielectric core that is opposite from the first side; and

an array of dielectric-filled, guided-wave cavities in the first dielectric cladding extending transversely from the dielectric core into the first dielectric cladding and forming an array of apertures through which optical energy that is introduced into the core exits from the core, each cavity of the array of cavities having one or more transmission modes that during operation couple to the one or more guided-wave modes of the guided-wave structure thereby causing said optical energy to exit from the core through each aperture of the array of apertures.

28. (Original) A system comprising:

an optical measurement instrument; and

a multiple source array which during operation provides an array of optical beams as input to the optical instrument, wherein the multiple source array comprises:

a guided-wave structure including a planar dielectric core, a first dielectric cladding layer covering a first side of the dielectric core, and a second dielectric cladding layer covering a second side of the dielectric core that is opposite from the first side;

an array of dielectric-filled, guided-wave cavities in the first dielectric cladding extending transversely from the dielectric core into the first dielectric cladding and forming an array of apertures through which optical energy that is introduced into the core exits from the core; and

a source that during operation generates and delivers an optical beam to the dielectric core.

29. (Original) The system of claim 28 wherein the optical instrument is a microscope.

30. (Original) The system of claim 29 wherein the microscope is a confocal microscope.

31. (Original) The system of claim 28 wherein the optical instrument is an interferometric microscope.

32. (Original) The system of claim 31 wherein the interferometric microscope is an interferometric confocal microscope.

33. (Original) The system of claim 32 wherein the interferometric microscope is an interferometric far-field confocal microscope.

34. (Original) The system of claim 32 wherein the interferometric microscope is an interferometric near-field confocal microscope.

35. (Previously Presented) The system of claim 28 wherein the guided-wave structure functions as an aperture array beam-splitter for beams incident on the array of apertures in a direction opposite to the direction that the optical energy exits from the core.

36. (Canceled)

37. (New) The multiple source array of claim 1 wherein during operation the guided-wave modes are excited within and propagate along the dielectric core.

38. (New) The multiple source array of claim 27 wherein during operation the guided-wave modes are excited within and propagate along the dielectric core.